

Citation:

Kramer MS, Kakuma R. The optimal duration of exclusive breastfeeding: a systematic review. Adv Exp Med Biol. 2004;554:63-77. Review. PMID: 15384567

PubMed ID: [15384567](#)

Study Design:

systematic review

Class:

M - [Click here](#) for explanation of classification scheme.

Research Design and Implementation Rating:

POSITIVE: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

To review available evidence related to lactation and infant feeding recommendations related to lactation

Inclusion Criteria:

- controlled clinical trials and observational studies
- published in all languages
- examined whether or not exclusive breastfeeding (EBF) until 6 months of age has an impact on growth, development, morbidity, and survival of healthy, term infants and their mothers
- studies of low-birth weight (<2500 g) provided that the infant was born at term (≥ 37 weeks)
- internal comparison group that was one group of infants who received EBF for ≥ 3 but < 6 months and mixed breastfeeding (MBF) until 6 months of age or later (i.e. infants were introduced to liquid or solid foods between 3 and 6 months of age), and another group of subjects who were breastfed exclusively for ≥ 6 months.

Exclusion Criteria:

- studies based on external comparison with reference data
- studies comparing EBF and MBF from birth
- studies that investigated the effects of age at introduction of nonhuman milk liquid or solid foods, but did not ensure EBF ≥ 3 months prior to their introduction

Description of Study Protocol:**Identification of studies:**

Two independent literature searches were conducted (staff at WHO's Department of Nutrition for Health and Development and one by the authors)

WHO search (August 22, 2000)

- MEDLINE (1966-August, 2000)
- Pre-MEDLINE (Index Medicus previous to 1966)
- CINAHL (1982 to June, 2000)
- HealthSTAR (1975-August 2000)
- EBM Reviews-Best Evidence (1991 to July/August, 2000)
- Cochrane Database of Systematic Reviews (Issue 2, 2000)
- CAB Abstracts (1973 to July 2000)
- EMBASE-Psychology (1987 to 3rd Quarter, 2000)
- Econlit (1969 to August, 2000)
- Index Medicus for the WHO Eastern Mediterranean (IMEMR)
- African Index Medicus (AIM)
- Lilacs
- MeSH terms: "breast feeding", and otherwise the free language terms "breastfeeding", "breast feeding", or breast-feeding combined with "exclusive" or "exclusively"

Author search (August 12, 2000)

- MEDLINE (1966 to week 3, September, 2000)
- CINAHL (1982 to April 2000)
- HealthSTAR (1975 to August, 2000)
- BIOSIS (1989 to 2000)
- CAB Abstracts (1973 to June 2000)
- Cochrane Database of Systematic Reviews (Issue 3, 2000)
- Cochrane Controlled Trials Register (Issue 3, 2000)
- EMBASE-Medicine (1980 to present)
- MeSH terms: "breast feeding", "infant", and "growth"

Data abstraction: stratified by study design (controlled trials vs observational studies) and provenance (developing vs. developed country)

Assessment of study quality:

- Cochrane criteria for assessing the adequacy of randomization and concealment of controlled clinical trials
- the 5-point Jadad scale was used to examine the quality of randomized controlled trials
- Observational studies (cohort, case-control, and cross-sectional) were assessed for: control from confounding, losses to follow-up, and assessment of the outcome
- Quality assessments of eligible studies carried out independently by 2 reviewers; disagreement solved by consensus

Design : systematic review

Statistical Analysis :

- conducted using Review Manager 4.2 software for preparing Cochrane review
- effect measures reported as the fixed-effect weighted mean difference (WMD) and its 95% confidence interval (CI)
- for continuous outcomes, a positive WMD denotes a more favorable value in the EBF group
- all dichotomous outcomes are formulated as adverse: an RR < 1 denotes that the EBF group

had a lower risk of the outcome than the MBF group

Data Collection Summary:

Dependent Variables

- weight and length gain
- weight-for-age and length-for-age z-scores
- head circumference
- iron status
- gastrointestinal and respiratory infectious morbidity
- atopic eczema
- asthma
- neuromotor development
- duration of lactational amenorrhea
- maternal postpartum weight loss

Independent Variables

- exclusive breastfeeding (EBF): breastfeeding only
- mixed breastfeeding (MBF): receive complementary foods in addition to breast milk (juices, formula, other milks, other liquids, solid foods)

Description of Actual Data Sample:

Number of studies identified: N=2,668

- WHO search: N=1,035 after removing duplicates
- Author search: N=1,845, of which 1,633 were different from those identified in WHO search

Number of unique citations: N=38 comprising 19 separate studies

Location: Canada and Switzerland

Summary of Results:

Key Findings

- Data from 2 trials in a developing country (Honduras) found prolonged breastfeeding to be associated with more rapid maternal postpartum weight loss.

Other Findings

- Controlled clinical trials and cohort observational studies from either developing or developed countries, suggest that infants who continue to be breastfed exclusively for 6 months show deficits in weight or length gain compared with infants who receive complementary feeding in addition to breastfeeding after 3 or 4 months. However, data are insufficient due to low sample sizes to rule out a modest increase in risk of undernutrition with exclusive breastfeeding for 6 months.

- Data are conflicting with respect to iron status but suggest that in developing countries, where iron stores of newborn infants may be suboptimal, exclusive breastfeeding without iron supplementation through 6 months may compromise hematologic status.
- One large randomized trial in a developing country (Belarus), infants who continue to breastfeed for 6 months or more appear to have a significantly reduced risk of one or more episodes of gastrointestinal tract infection.
- No significant reduction in risk of atopic eczema, asthma, or other atopic outcomes were demonstrated in studies from Finland, Australia, and Belarus.
- Data from 2 Honduran trials suggest that exclusive breastfeeding through 6 months of age is associated with delayed resumption of menses.
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Author Conclusion:

No objective evidence of a "weaning's dilemma" was found. Large randomized trials are recommended in both developed and developing countries to ensure that exclusive breastfeeding for 6 months does not increase the risk of undernutrition (growth faltering), to confirm the health benefits reported thus far, and to investigate other potential effects on health and development, especially over the long-term.

Reviewer Comments:

Research Design and Implementation Criteria Checklist: Review Articles

Relevance Questions

- | | | |
|----|---|-----|
| 1. | Will the answer if true, have a direct bearing on the health of patients? | Yes |
| 2. | Is the outcome or topic something that patients/clients/population groups would care about? | Yes |
| 3. | Is the problem addressed in the review one that is relevant to nutrition or dietetics practice? | Yes |
| 4. | Will the information, if true, require a change in practice? | Yes |

Validity Questions

- | | | |
|----|--|-----|
| 1. | Was the question for the review clearly focused and appropriate? | Yes |
| 2. | Was the search strategy used to locate relevant studies comprehensive? Were the databases searched and the search terms used described? | Yes |
| 3. | Were explicit methods used to select studies to include in the review? Were inclusion/exclusion criteria specified and appropriate? Were selection methods unbiased? | Yes |
| 4. | Was there an appraisal of the quality and validity of studies included in the review? Were appraisal methods specified, appropriate, and reproducible? | Yes |
| 5. | Were specific treatments/interventions/exposures described? Were treatments similar enough to be combined? | Yes |

6.	Was the outcome of interest clearly indicated? Were other potential harms and benefits considered?	Yes
7.	Were processes for data abstraction, synthesis, and analysis described? Were they applied consistently across studies and groups? Was there appropriate use of qualitative and/or quantitative synthesis? Was variation in findings among studies analyzed? Were heterogeneity issues considered? If data from studies were aggregated for meta-analysis, was the procedure described?	Yes
8.	Are the results clearly presented in narrative and/or quantitative terms? If summary statistics are used, are levels of significance and/or confidence intervals included?	Yes
9.	Are conclusions supported by results with biases and limitations taken into consideration? Are limitations of the review identified and discussed?	Yes
10.	Was bias due to the review's funding or sponsorship unlikely?	Yes

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